

DeSoto National Wildlife Refuge

Annual Narrative Report

Missouri Valley, Iowa
Fiscal Year 2000



Lacey Blum 5/21/01
Refuge Manager Date

Don Kauffel 6/19/01
Refuge Supervisor Date

Mike M. Zuber 2.12.01
Regional Chief, NWRS Date

Highlights

Monitoring and Studies

- ▶ Waterfowl use days were the lowest since 1963.
- ▶ Second highest number of bald eagles (138) were observed in February.
- ▶ A new count circle for the Audubon Society Christmas Bird Count encompasses both DeSoto and Boyer Chute NWRs. It has substantially fewer crop fields than the previous count circle.
- ▶ Weather was unusually warm and dry throughout the year.

Habitat Restoration and Management

- ▶ Wood Duck Trail rehabilitation improves water control and increases managed wetland acres.
- ▶ Nitrogen fertilization of the biological crop rotation is modified.

Coordination Activities

- ▶ FWS equips Loess Hills Alliance fire caches.

Resource Protection

- ▶ DeSoto officers assist FWS Special Agents with serving arrest and search warrants for an uncover operation in the illegal take and sale of wildlife.

Public Education and Recreation

- ▶ Commemorative steamboat exhibit attracts people from throughout the country.
- ▶ The Marquardt Pond Environmental Learning Site development is complete and open for business.
- ▶ Changing the white-tailed deer muzzle loader hunt to include a late October antlerless only hunt is a success.
- ▶ The first year for the new snow goose controlled hunt is dismal. Hunter success was low due to an unusual fall migration and unusually mild weather.
- ▶ Spring crappie fishing is spectacular.

Planning and Administration

- ▶ Bill Lutz was hired as the refuge's first "Chief Ranger".
- ▶ Project Leader, George Gage, retires after 22 years at DeSoto and 34 years with the Service. Larry Klimek, Cape Romain NWR, Charleston, SC is the new Project Leader.
- ▶ The Comprehensive Conservation Plan is nearing completion.

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Introduction

DeSoto National Wildlife Refuge is found south of US Highway 30 midway between the farming communities of Blair, Nebraska and Missouri Valley, Iowa. The refuge is situated astride the Missouri River, 20 miles north of Omaha, Nebraska. It lies in Harrison and Pottawattamie Counties, Iowa and Washington County, Nebraska.

The U.S. Fish and Wildlife Service established the refuge in 1958 to preserve habitats for migratory waterfowl. The Migratory Bird Conservation Act and Migratory Bird Stamp Act authorized acquisition. It serves as a seasonal resting area for up to one-half-million waterfowl, primarily lesser snow geese and mallards.

This 7,823-acre refuge lies in the wide, fertile plain of the Missouri River Valley on former river meanders. Cottonwood bottom lands characterize portions of the refuge. Approximately 2,000 acres are biologically managed as croplands. Cool- and warm-season native grasses have been reestablished on more than 1,500 acres to provide additional biological diversity.

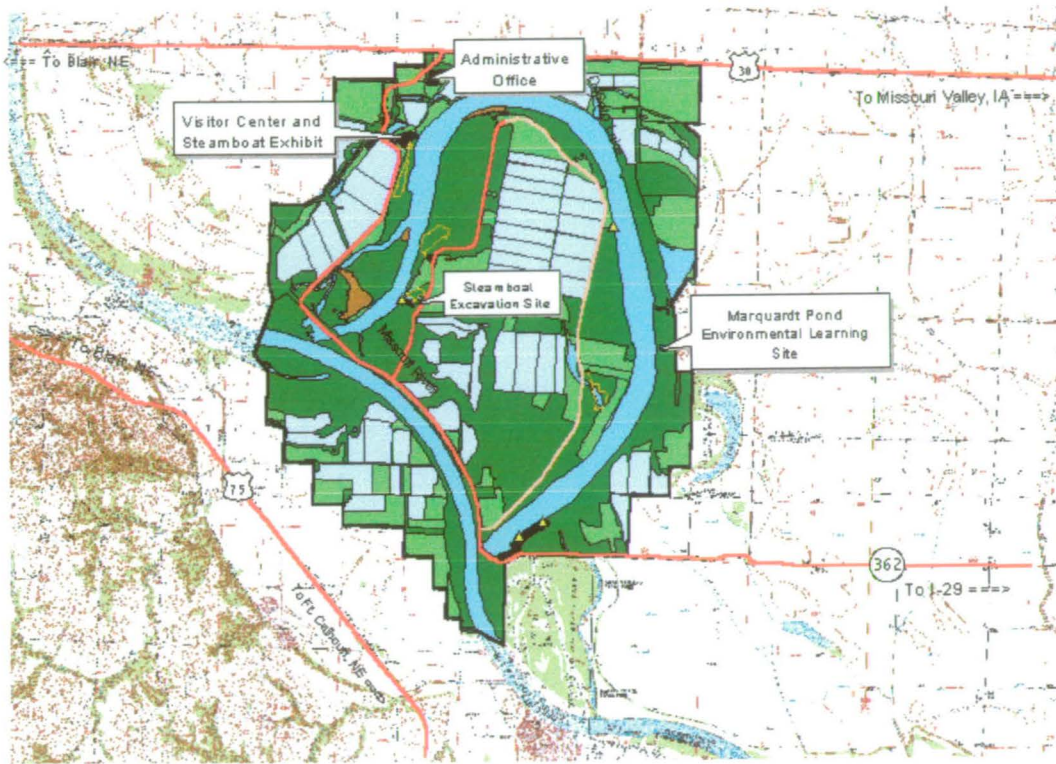
The focal point for both man and wildlife is a former oxbow of the Missouri river - the 788-acre DeSoto Lake. Recreational demand for its use has remained high since refuge establishment in 1958. The refuge provided active recreation throughout its early history, including fishing, picnicking, boating, waterskiing and swimming. Approximately 16-million-dollars worth of facilities accommodated public demand of 500,000 visitors annually. In the 1980s, management emphasis was redirected toward a more balanced program between man and wildlife, emphasizing wildlife-dependent recreation.

The 1968 excavation of the steamboat *Bertrand*, which sank in 1865, on what is now the refuge, adds a major historical emphasis to the refuge program. The 200,000 artifacts in the Bertrand Collection provide a significant assemblage of Civil War-era artifacts; a time capsule of regional and national historical significance.

In 1981, the DeSoto Visitor Center was opened. The visitor center is the permanent home of the Bertrand Collection. The five-million-dollar, 26,000-square-foot building contains exhibits interpreting the importance of the *Bertrand* and the historical development and ecological change that occurred within the Missouri River Basin. Besides environmentally-controlled artifact storage and museum exhibit areas, the building houses a laboratory for artifact treatment, a collection records area, and reference library.

The Visitor Center also provides exhibits depicting the natural history of the area and its wildlife. Viewing galleries overlooking DeSoto Lake provide excellent opportunities to observe waterfowl and bald eagles during the spring and fall migration periods. A variety of audiovisual equipment provides effective interpretation to an average of 160,000 visitors who pass through the center each year.

DeSoto National Wildlife Refuge



Land Use

- Aquatic
- Bare Ground
- Crop
- Facilities
- Grass
- Timber

- Year Round Road
- Seasonal Road
- Boat Access
- Interpretive Trails
- Refuge Boundary



1

Monitoring and Studies

1a Surveys and Censuses

Wildlife - The fall migration began slowly. Only a handful of ducks and a few Canada geese were using the refuge by the end of October. The weather throughout much of the U.S. and Canada was very mild and dry slowing the migration. Snow geese didn't begin to migrate until November with only 400,000 reported south of the border by mid-month. The refuge held only 115,000 snow geese and 23,000 ducks, mainly mallards, on November 24. The 24th would be the peak number for ducks. Geese peaked on December 1 with only 200,000. This is the lowest peak population since 1983. A winter storm on December 19 pushed the last of the waterfowl out of DeSoto.



Waterfowl use days were extremely low. Fall duck use days totaled 415,730, compared to the five-year average of 3,539,891. Fall snow goose use days totaled 3,394,256, much lower than the five-year average of 10,107,619. The total fall waterfowl use days totaled 3,809,986. The refuge hasn't experienced waterfowl use this low since 1963.

DeSoto held the annual Audubon Christmas Bird Count on December 19. This was the first count with a new circle that encompasses Boyer Chute NWR. Twenty years of data was established under the former circle. However, it was decided Boyer Chute needed to be involved in a Christmas Bird Count, too. A new count circle was established encompassing both Boyer Chute and DeSoto. The new circle contained much more wildlife habitat than the previous circle around DeSoto. The count was on a cold and stormy day. Volunteer birders, many from the Omaha Chapter - Audubon Society, and other interested birders counted 72 species, which was a very good count. Volunteer birders also counted 93 species in the DeSoto Spring Bird count held on April 29.

Mild winter weather thawed the lake in mid-February. Bald eagles descended on the refuge giving us the second highest count ever of 138 birds on February 22. Within a week the eagles and 1,200 common mergansers had cleaned up the winter fish kill and moved on.



The spring migration brought mallards, common and hooded mergansers, green and blue-winged teal, lesser and greater scaup, bufflehead, rudy duck, northern shovelers, ring-necked duck, wood duck, and widgeon to the refuge. Also snowy egrets, black-crowned night herons, cattle egrets, and great egrets were seen throughout April and May which are unusual for this location.

American white pelicans arrived in August. An unusually high number, 2,000, resided on the refuge throughout much of September.

Fishery -An informal creel survey was documented during the six-month angling season, as the annual formal fish survey was not conducted this year. Crappie, both white and black, are abundant in most age classes, with some 10"-14" in length. The flooding conditions of the last four to five years and artificial structures (trees and pallets) have benefitted the growth rate of these highly prized fish. Largemouth bass numbers are still out of balance and the numbers of 15"+ legal fish are still fewer than is desirable. However, the last two years of formal surveys suggest the largemouth bass fishery may be improving. The surveys suggest some two-year age class bass are surviving the winter. Numerous 6-8" bass were caught during the spring/summer season this year which is encouraging.



Habitat Project - Eagle Scout fish habitat project.
Photo:SVR

Both channel and flathead catfish harvest numbers and weights have increased over the last several years based upon informal creel surveys. Bluegill/Green Sunfish continue to be prevalent, but small. The majority of the walleye caught are less two pounds, although there have been reports of several walleye weighing more than six pounds. Carp and buffalofish are abundant, with the carp weighing much less than the buffalofish. Northern pike are still infrequently observed throughout the lake. White bass are occasionally observed in creel surveys and in commercial fishing nets.

The rough fish population continues to increase and threaten the overall quality of DeSoto Lake's sport fishery. Gizzard shad numbers continue to dominate the lake's biomass, and some are large enough that several have been caught in commercial fishing nets. Low dissolved oxygen levels and low water levels contributed to a



Winterkill in Visitor Center pond. Photo:SVR

small number of carp, shad, bullheads, bluegill, and bullfrogs dying in two Visitor Center ponds in March.

Note worthy events were:

- ▶ During most of February, common mergansers were observed herding thousands of gizzard shad along the shoreline near the Visitor Center viewing gallery and feeding heavily upon the schooled masses.
- ▶ Reports of at least six flathead catfish caught ranging from 22 to 50 pounds in size were caught this year. Flatheads ranging from 4 to 15 inches were stocked in DeSoto Lake from 1994 to 1996 to help reduce the number of small bullheads in DeSoto Lake. The plan was successful. Bullheads are seldom observed.

Geographic Information System - Digitally mapping the refuge continued this year. GIS coverages were created or updated using downloaded GPS data and onscreen digitizing using U.S. Geological Survey digital orthophoto quarter quadrangles as base maps. Coverages created or updated this year include political boundaries, private land next to the refuge, hiking trails, roads, roadside signs, rock jetties, wells, habitat boundaries, sampling sites for water quality and prescribed fire monitoring, soils, invasive weeds, hunting zones, and eagle and goose use areas.

Refuge managers are slowly increasing use of GIS technology to help with decision-making. Most of the use is to calculate acres of habitats and to illustrate management decisions. For example, an objective of the recently completed Comprehensive Conservation Plan was to substantially reduce crop land and reduce habitat fragmentation, i.e., edge effect. GIS was used to calculate edge and identify locations where reversion of crop land would provide the largest reduction in edge. Also, the refuge is working with the Audubon Society - Omaha Chapter to develop a map of sixty prime birdwatching areas in seventeen counties of southeast Nebraska and southwest Iowa.

1b Studies and Investigations

Research on White-tailed Deer at DeSoto National Wildlife Refuge, 2000. Jason Gilsdorf and Scott Hygnstrom, University of Nebraska, Lincoln, NE 68583-0819, Kurt VerCauteren, USDA/APHIS National Wildlife Research Center, Ft. Collins, CO 80521-2154. Two research projects were conducted on white-tailed deer (*Odocoileus virginianus*) at DeSoto National Wildlife Refuge (DNWR) during 2000. The first is a long-term study on deer in the Missouri River valley. Kurt VerCauteren and Scott Hygnstrom initiated the radio-telemetry study in 1990. Thirteen radio-collared deer were monitored using radio telemetry from 29 May 1999 to 9 March 2000. Twenty-eight additional deer were captured on DNWR from 10 March 2000 to 16 March 2000. Fourteen of the captured deer were equipped with radio collars. More than 2000 radio locations were collected and more than 1400 direct observations from 29 May 1999 to the

present on the 27 radio-collared deer. Data will be used to evaluate the impacts of land-use practices on home ranges, habitat use, and movement of deer. The second study is an evaluation of frightening devices used to reduce deer damage in cornfields in and around DNWR. We are currently analyzing data collected on crop loss, field incursions, and home ranges to determine the effectiveness of propane cannons, electronic guards, and a new bioacoustic, animal-activated device. Field research will continue on frightening devices at DNWR through the summer of 2001. The research is part of a Masters' program with the University of Nebraska. Continuation of this research will lead to an increased understanding of deer and deer damage, which will facilitate wise management.



Water Quality of DeSoto Lake, 2000. Carla M. Delucchi, Dana College, Blair, NE 68008.

Dana College biology students monitored water quality of DeSoto Lake during 2000 as had been done in 1997 and 1998. In these previous years, they found a decrease in total phosphorus and chlorophyll levels compared to other studies done in 1978 and 1994. During this study, total phosphorus and chlorophyll levels were intermediate. The year 2000 had unusually low rainfall that may have contributed to this pattern. Phosphate levels did not change during the high rainfall year of 1998, although chlorophyll levels decreased. This indicated that internal phosphorus loading may be more important than runoff from surrounding lands. The increase at low levels seen in 2000 may also be a result of internal loading since loading would be from the surface of the bottom sediment with input per unit area not per unit volume. Nitrogen continued to follow a pattern of a direct relationship between rainfall and concentration.

Total phosphorus was high all year, averaging more than the summer average for 1997 and 1998 on every date. Chlorophyll showed a typical pattern of increasing in summer then peaking after the end of stratification in August.

1c Climatic Data

Seasons' Highlights

Temperature - High temperature for the year was 100° F on August 31. The low temperature for the year was -9° F on December 21. Temperatures were well above normal from November through March. Average high temperatures for this period were eight to seventeen degrees Fahrenheit above normal and average daily lows were three to twelve degrees Fahrenheit above normal. The remaining months were normal to above normal. A killing frost (28° F or less) did not occur until November 3 which is about three weeks later than normal. A killing frost usually occurs within the first two weeks of October. The winter months were very mild, and the spring and summer months were typical, warm and humid.

Precipitation - The refuge received much below normal annual rainfall (e.g., 65% of normal). Only three months, February, June and July, were near or above normal rainfall. The other nine months were below normal. August and September produced only 27% of normal rainfall. Rainfall was consistently below normal from October through the third week of June. Starting on June 24 and for the next two weeks rainfall increased substantially accounting for half the total rainfall for June and July. Rainfall again became scarce after July 6.

Crops struggled during much of June but, recovered in late June and on into July with the increased rainfall. However, the lack of rain during the latter part of the growing season reduced yields. Weed control was compromised by the early dry weather and late June rainfall. Prairie restoration benefitted by the early dry weather allowing refuge staff enough time to complete field work. The late June rain helped with seed germination and seedling establishment.

Table 1c 1. FY 2000 Precipitation and Temperature Summary				
Month	Precipitation (*Inches)		Average Temperature(of)	
	1999-2000	Average**	Maximum	Minimum
October	0.10	1.80	72	40
November	0.90	1.46	65	34
December	0.50	0.88	44	20
January	0.35	0.65	40	18
February	0.90	0.96	50	27
March	1.28	1.51	59	34
April	1.91	2.60	69	42
May	1.82	3.75	80	55
June	5.43	4.49	83	60
July	3.13	3.23	85	66
August	0.74	3.48	89	66
September	1.00	3.07	84	55
Total	18.06	27.88		

*Includes snowfall **30-year average

2

Habitat Restoration

2a Wetland Restoration (Off Refuge)

DeSoto's funding allocation for the Private Lands (Partners for Fish & Wildlife) program totaled \$15,000 for FY 2000. Several partnerships with both private and government organizations have helped considerably to restore, enhance, and protect wetland and upland habitat within DeSoto's 18-county Private Lands Management District. The more active partners included Ducks Unlimited, Pheasants Forever, Golden Hills Resource Conservation and Development, the Natural Resource Conservation Service, and the Iowa Department of Natural Resources.

During the year eight wetland habitat projects, in four counties, were completed totaling 516 acres. Four projects were in Carroll County, two in Pottawattamie, and one each in Monona and Fremont Counties.



Wetland restoration in Loess Hills State Forest.
Photo:SVR

Noteworthy projects included:

- ▶ The Draper WRP project totaling 432 acres in Fremont County was a complex wetland project involving many agencies and considerable restoration and enhancement work. The Service provided technical assistance and funding for excavation and several nesting islands throughout the wetland complex.
- ▶ The 20-acre Shelby Wetland project, for the City of Shelby, Iowa started as a dream back in 1991 by the late Reverend Stan Nielsen. The Service helped NRCS, the City of Shelby, Iowa Natural Heritage Foundation and Ducks Unlimited in this highly visible wetland project in Pottawattamie County.
- ▶ The Honey Creek Wetland project in Pottawattamie County was another long-term project that started back in the early '90's. The 20-acre restored wetland on the Ed & Chris Christensen property was finally completed with considerable involvement by the Service, Ducks Unlimited, NRCS and the Pottawattamie Soil and Water Conservation District.

Nearly every habitat project accomplished through the Private Lands program was in coordination with one or several other organizations. See Section 5a for more information on Interagency Coordination.

2a Wetland Restoration: On-refuge

A levee and stop log structure were installed on the upper end of Wood Duck Pond replacing an old board walk. Water levels in Wood Duck Pond and an area between the pond and the lake can be filled and managed separately with this arrangement. The area between the pond and lake is an old diverse wetland with very shallow mud flats and deeper bullrush areas.

2b Upland Restoration: Off-Refuge

Two upland sites were planted to native grasses totaling 41-acres this fiscal year. One was a 25-acre native grass planting in Montgomery County and the other was a 16-acre planting in Carroll County.

Native grass planting on two former FmHA easements in Harrison County, the Barry and Bruck Easements, were somewhat successful. There are other easement restorations that may need to be reseeded including a native grass planting in Montgomery County and a 16-acre planting in Carroll County.

2b Upland Restoration: On-refuge

Table 2b 1 <i>Summary of Grassland Planting</i>			
Location	Acres	Grass Mix	Comments
East Dike; east-central	30.0	Intermediate and tall wheatgrass	Cropland reversion; Spring new seeding
East Dike; east of southeast parking lot	25.3	Intermediate and tall wheatgrass	Cropland reversion; Spring new seeding
South of Visitor Center along DeSoto Avenue	17.6	Mesic warm-Season grasses and wildflowers	Warm-season grassland renovation; spring seeding
Westside; south of south parking lot	63.1	Mix of carryover warm-season grass seed	Cropland reversion; Spring new seeding
Westside; north of north parking lot	33.3	Wet warm-season	Cropland reversion; Spring new seeding
Total = 169.3			

A total of 169.3 acres of cool-season, and warm-season grass and wildflower seed was planted early May, and mid-June, respectively. Except for a chemically renovated native warm-season

grass field, mechanical tillage was used to prepare seedbeds and control emerged vegetation in new plantings. All sites were maintained after planting with periodic mowing. The renovated field was treated with 1 quart per acre Roundup (glyphosate) and ½ pint per acre 2,4-D to control emerged vegetation. One week after the herbicide application the field was planted to mesic cool- and warm-season grass mix and wildflowers.

The refuge, over the years, has acquired a sizeable quantity of warm-season grass seed carried over from previous years. Rather than disposing of this seed it was planted at a high seeding rate (e.g., 10 to 12 lbs. bulk seed per acre). The higher seeding rate was intended to compensate for potential stand establishment problems associated with old seed, such as poor seed germination and reduced seedling vigor. Enough carryover seed was available to plant a 63-acre field on the refuge's west side. A variety of species were planted including big bluestem, little bluestem, switchgrass, Indiangrass, sideoats grama, needlegrass, tall wheatgrass and intermediate wheatgrass. Initial assessment of stand establishment is variable. Stand establishment will be assessed over the next two growing seasons to determine the relative success of the new seeding, and decide whether additional planting is necessary.

Rainfall although below normal for the growing season was adequate to achieve good grass and wildflower seed germination and seedling establishment. Rainfall occurred in three distinct periods. Rainfall was below normal during the early part of the growing season allowing field operations to be completed without significant interruption. Rainfall was above normal from the last week of June through the first ten days in July. This provided soil moisture conditions conducive for seed germination and seedling establishment. The remainder of the growing season rainfall was below normal, but adequate to support plant growth.

Table 2b.2: Grass and Wildflower Seed Mixes Planted			
Grass Seed Mix	Species	Cultivar	Seeding Rate (lbs. PLS / acre)
Wheatgrass	Tall wheatgrass	Alkar	7.0
	Intermediate wheatgrass	Oahe	5.0
Mesic Warm-Season	Big bluestem	Pawnee	2.0
	Little bluestem	Camper	2.5
	Indiangrass	Oto	2.0
	Switchgrass	Blackwell	1.5
	Needlegrass	none preferred	1.0

	Virginia wildrye	O'ma'ha	0.5
Wildflower Mix	Purple coneflower	Not Applicable	0.1
	Leadplant		0.01
	Black-eyed susan		0.03
	Illinois bundleflower		0.2
	Gray-headed coneflower		0.05
	Butterfly milkweed		0.01
	False sunflower		0.14
	Maximilian sunflower		0.07
	Wild bergamot		0.01
	New England aster		0.01
	Purple prairie coneflower		0.05
	Pale purple coneflower		0.03
Wet Warm-Season	Big bluestem	Pawnee	2.5
	Indiangrass	Oto	2.5
	Switchgrass	Trailblazer	2.0
	Virginia wildrye	O'ma'ha	1.0
	Tall wheatgrass	Alkar	1.0

3

Habitat Management

3a Water Level Management

The station's wetlands did not require any spring pumping. Willow, Headquarters, and Buchardt wetlands were recharged in the fall.

3b Moist-Soil Management

The new moist-soil unit was pumped in the fall. The lower end of the unit is beginning to be choked with cattails and needs renovating.

The old moist-soil unit has substantial damage to levees and needs renovating. The unit has remained too wet for the last several years to operate heavy equipment in it. When equipment can get into the unit, work will begin.

3c Graze/Mow/Hay

The refuge contracted with a local farmer for harvesting alfalfa. This was the second year of a three-year cash rent contract issued through competitive bidding. Refuge specific harvest practices were used on 87.2 acres of alfalfa, 53.7 acres of smooth brome grass and 33.3 acres of a new alfalfa seeding and oat nurse crop. The most important practices for wildlife are limiting harvest to two cuttings annually, between July 15 and September 10, and no insecticide use. Delayed harvest dates are necessary to avoid disturbing nesting birds. Cash rent was \$5,752.20. The farmer was paid \$1,888.85 for the custom farm services to plant and establish the 33.3 acre new seeding. Cash rent was reduced proportionally for a net cash rent of \$3,863.35.

3d Farming

Cooperative Farming - Six local farmers cultivated 1,948.3 acres of refuge crop land using a three-year corn-soybean-sweet clover "biological" crop rotation. Also, farmers used a six-year corn-soybean-alfalfa biological crop rotation and a two-year conventional crop rotation on a few crop fields. Farmers contracted to farm refuge crop land for a two-thirds crop share. Crop land provides food and loafing areas for migrating waterfowl, food, cover and edge for other species. Crops produced and acres in production are summarized in table 3d.1.

Table 3d.1 Crop Grown and Acres Planted

Crop	Biological Crop Rotation		Conventional Crop Rotation 2-Year	Acres x Crop
	3-Year	6-Year		
Corn	585.8	35.3	64.2	685.3
Soybeans	605.9	36.2	46.9	689.0
Sweet Clover/Small Grain	404.6	----	----	404.6
Milo	48.9	----	----	48.9
Alfalfa	----	120.5	----	120.5
Acres x Crop Rotation	1645.2	192.0	111.1	
Total Crop Acres	1948.3			

Rainfall was below normal during the early part of the growing season allowing field operations to be completed without significant interruption. Rainfall was above normal from the last week of June through the first ten days in July. This rainfall period was crucial for attaining average crop yields this year. Without it yields would probably have been much less. On the other hand the mid-season rainfall induced a late season weed flush compromising weed control to some extent. The remainder of the growing season rainfall was below normal. Overall rainfall was substantially below normal for the crop season (April - September). In spite of the lack of rainfall crop yields were near the refuge's long-term average. Corn yields averaged 109.8 bushels per acre and soybeans averaged 36.1 bushels per acre. The 5-year average yield for corn is 107.4 bushels per acre and soybeans is 36.7 bushels per acre.

Crop Scouting - This year was the third year for the integrated pest management scouting program for agricultural crops. It is managed day-to-day by a local commercial scouting service, including field scout supervision, with oversight by the refuge biologist. The cost is shared by the refuge and cooperative farmers.

Information produced by the scouting program has helped refuge farmers' make better management decisions. Four farmers have changed corn planting rates to produce optimum plant stands in the biological crop rotation. Comprehensive soil sampling has improved use of phosphorus fertilizer. Weed species have been identified and population densities determined within each crop field helping with herbicide selection and application rates. Also the timing of weed emergence is another important piece of information provided by the scouting program. This can help farmers time the herbicide application for maximum effect using the lowest

application rates. This latter information thus far has not been well utilized by the farmers. More coaching is needed to encourage farmers to better use this information essential to minimizing herbicide use.

Excess Grain - The refuge stores approximately 1,000 bushels of corn for potential depredation or disease management problems per existing management plans. Any grain in excess of management plan needs is used to attract waterfowl to the vicinity of the visitor center during fall migration and for filling the Visitor Center's bird feeders. When spring arrives, any held-over grain is used to reimburse refuge farmers for early season custom work provided to the refuge or transferred to other field stations.

Table 3b.2. <i>Inter-elevator Grain Transfers to USFWS Field Stations</i>	
Field Stations	\$ Amount
Region 3	
Agassiz	8,000.03
Necedah	700.53
Shiawassee	3,000.01
Swan Lake	12,5000.00
Tamarac	1,076.48
Region 5	
Blackwater	7,510.08
Erie	5,469.84
Great Swamp	1,000.02
Region 6	
Benton Lake	1,346.41
Kulm WMD	2,500.01
Lake Andes	1,500.00
Fort Niobrara/Valentine	7500.01
Medicine Lake	5,000.01
National Elk	16,488.29
Total	\$73,591.72

Under the current crop land management plan, the refuge's entire share of soybeans and some corn is harvested and sold locally with the proceeds from the sale used to reimburse cooperators (per Iowa State University Extension Publication FM-1698 "2000 Iowa Custom Rate Survey") for custom farming such as seedbed preparation for grassland planting. Any excess remaining after reimbursing refuge farmers is transferred to other field stations. In 2000, refuge farmers were reimbursed \$16,524.15. Remaining grain monies was transferred to the stations listed in Table 3b.2.

Some grain was left in fields as standing crop to limit use by waterfowl, providing food through the winter bottleneck for resident wildlife and afford cover for hunters per the new snow goose hunting program.

Prescription Nitrogen Management - Prior to the 2000 crop season the application of nitrogen fertilizer to corn grown in the biological crop rotation was prohibited. Refuge managers assumed the sweet clover green manure crop provided adequate nitrogen for the following corn crop. The practice of using sweet clover as the sole nitrogen source originated from the refuge's objective to reduce the use of synthetic fertilizers in crop production to protect ground and surface water from nitrate contamination. This practice had been evaluated, since the biological crop rotation was started in 1978, by comparing corn yields from fields managed under the biological crop rotation to yields from fields managed under a conventional crop rotation in which nitrogen fertilizer was permitted. Results showed that corn yields between the two crop rotations were essentially equivalent. However, the yield data was confounded by significant differences in soil types, corn hybrid selection, management skill of refuge farmers, and unrealistic restrictions on nitrogen fertilization in the conventional crop rotation. This largely limited meaningful comparisons between the two crop rotations. There had not been any controlled field research to assess the nitrogen value of the sweet clover green manure crop until 1995.

Starting in 1995 replicated field trials were established to assess whether sweet clover was providing sufficient nitrogen to a following corn crop to attain yields that were comparable to modern production levels. These trials were completed in 1999. The results show that although sweet clover in some years did provide adequate nitrogen it is highly variable from year to year and to some extent from field to field. Sweet clover on average provided approximately half the nitrogen needed to attain yields comparable to corn grown on private crop land. Based on Iowa State University soil test recommendations sweet clover usually needs to be supplemented with approximately 70 lbs. nitrogen per acre to attain corn yields equivalent to production levels attainable using modern production practices.

Based on this research nitrogen management practices for the biological crop rotation were changed for the 2000 crop season. The application of nitrogen fertilizer to corn is now permitted, but is restricted. These restrictions are adjusted field-by-field according to internal and external soil drainage characteristics, historic rainfall patterns, and use of the late spring soil nitrate test

wherever practical. This minimizes nitrogen fertilizer use and targets nitrogen fertilizer applications to fields with the greatest potential for a yield response.

Nitrogen fertilizer use is restricted in the following ways:

- ▶ Crop fields that predominately contain soils with poor internal or external drainage can be fertilized with a maximum of 70 lbs. nitrogen per acre applied in the spring prior to planting, or nitrogen fertilizer can be applied sidedress at a rate based on soil test results
- or
- ▶ Crop fields that predominantly contain soils with good internal and external drainage can be fertilized only by sidedressing at a rate based on soil test results.

This prescription approach to managing nitrogen fertilizer accommodates some of the conflicting issues related to producing corn on the refuge. First is the long-standing refuge objective of minimizing the environmental impact from synthetic farm chemicals used in crop production. Historically this was accomplished by replacing nitrogen fertilizer with the sweet clover green manure crop. A second and conflicting objective is the need for refuge farmers to produce profitable crop yields, and the desire of refuge management to develop a cropping system that is economically competitive. Since the recently completed research has shown sweet clover is often an inadequate nitrogen source, the prescription approach to managing nitrogen fertilizer provides a balance between these conflicting objectives. This compromise allows minimal nitrogen fertilization to achieve economically competitive corn yields. It also recognizes the practical limitations soil characteristics impose on field operations. The refuge's concern regarding nitrate contamination of ground and surface water is not likely to be undermined by allowing some nitrogen fertilization. Results from research completed on the refuge in 1992, which is consistent with similar research conducted in alluvial soils, shows that nitrates migrating past the crop root zone are rapidly denitrified upon reaching the water table. Thus, concern regarding nitrate contamination of ground and surface water is mitigated.

Winter Wheat Nurse Crop - This crop season refuge farmers started planting winter wheat as a nurse crop for sweet clover. Originally when the biological crop rotation was initiated farmers planted oats as a nurse crop. Nurse crops aid weed control by suppressing weed growth, particularly annual grass weeds, and also provide cash flow. However, problems with sweet clover stand establishment in the mid-1980's resulted in the eventual elimination of a nurse crop from the biological crop rotation. Starting in 1995 use of a nurse crop was reevaluated. However, by this time oats had lost most of its economic viability due to chronic low market prices and stringent grain quality requirements limit its marketability. Also, the local climate is not conducive to producing high yields. Currently local grain elevators refuse to take oats which virtually eliminates it as a viable crop in this locality. A search for an economically and agronomically viable alternative identified winter wheat as the best alternative.

Winter wheat can be marketed locally and good yields are attainable. It does have stringent grain quality standards, but these standards are more easily attained than with oats. Winter

wheat can be either planted by aerial seeding into a standing soybean crop (late September) or planted immediately after soybeans are harvested (late October). Either technique can work well, but both have limitations. Aerial seeding allows more time for the wheat to growth in the fall before winter weather arrives. Planting with grain drills is less expensive and plant stands are more uniform than aerial seeding. Use of winter wheat as a nurse crop for sweet clover is scheduled to be fully implemented in the fall of 2001 for the 2002 crop season.

Transgenic crops - Genetically engineered crop technology is providing refuge farmers with novel and useful tools aiding the production of crops. Refuge farmers have and currently use transgenic crops for weed and insect control.

Weed control has always been a challenge due to refuge restrictions on herbicide use, particularly broadleaf control in soybeans, and perennial weed control in corn and soybeans. The number and variety of herbicide chemistries available to refuge farmers is limited compared to what can be used on private crop land. However, the introduction of glyphosate resistant corn hybrids and soybean cultivars has dramatically improved weed control, in particular control of pigweed in soybeans. The glyphosate/glyphosate tolerant crop weed management program is cost effective, easy to use, and farmers are very familiar with glyphosate and comfortable working with it. This year glyphosate was applied to 87% of the corn and soybeans (1151.5 acres) grown on the refuge. However, wide spread continuous use of glyphosate or any herbicide is problematic. The agricultural community generally agrees the continuous use of the same or similar herbicide chemistries may eventually produce a weed population(s) resistant to those herbicides. Producers have been counseled regarding this potential problem which is a serious problem for the refuge crop program because of the limited herbicide options available to refuge farmers. If a weed becomes resistant to glyphosate there are no satisfactory alternative broadleaf weed control options in soybeans or for perennial weeds in corn and soybeans. If refuge farmers do not rotate herbicide chemistries between crops and routinely use mechanical cultivation, it is possible rotating herbicide chemistries will be mandated by the refuge. The number of crop acres in which any herbicide is used should not exceed 50% of the total crop acres for which the herbicide is registered.

Insect control, until recently, has largely been ignored by refuge farmers because only products containing *Bacillus thuringiensis* (*Bt*) can be used to control crop insect pests. Historically *Bt* efficacy has been marginal on most crop pests in the Midwest. Efficacy problems relate to placement and timing of the *Bt* application. Also, *Bt* is expensive relative to other synthetic insecticides. However, interest by refuge farmers has increased with the development of *Bt*-transgenic corn hybrids. *Bt*-transgenic corn hybrids will provide a high level of European corn borer control, often considered the second most serious corn insect pest in the Midwest. However, managing the development of resistance to the *Bt* toxin is important and environmental problems have been associated with *Bt*-transgenic hybrids. As with any pest control product that imposes a high level of population suppression the development of resistance by the target pest (i.e., European corn borer) is possible. The probability of this occurring with *Bt*-transgenic corn hybrids has been debated within the agricultural community.

Currently the U.S. Environmental Protection Agency, U.S. Department of Agriculture and state Extension services recommend planting non-*Bt* hybrid refuges within corn fields planted to *Bt*-transgenic hybrid(s). This practice is intended to maintain *Bt*-susceptible corn borer ecotype diluting or preventing development of a *Bt*-resistant population. Refuge farmers are required to use this practice when planting *Bt*-transgenic corn hybrids.

Also, research has documented that some *Bt*-transgenic corn hybrids produce pollen containing the *Bt* toxin. Consumption of *Bt* laced pollen by lepidopterous larvae can be fatal to some species. This is acceptable if the insect is an exotic pest species such as the European corn borer. It is not acceptable if it is a non-target native species such as the Monarch butterfly. However, the placement of non-*Bt* hybrids as a buffer between *Bt*-transgenic hybrids and natural areas should mitigate this problem. Corn pollen is relatively heavy and will not drift very far. Refuge farmers are required to buffer (60 feet) all corn fields planted with *Bt*-transgenic hybrids.

A third issue is *Bt*-transgenic crops are a prophylactic management tool. The use of prophylactic pest control practices is to some extent contrary to integrated pest management principles. Ideally a manager will implement a control measure only in response to a pest population that has or will soon exceed a population density that can inflict economically significant damage. A farmer planting *Bt*-transgenic hybrids assumes that a corn borer infestation will exceed the economic threshold for this pest. This may or may not be true and cannot be anticipated at planting time. A review of scouting reports from the last three years suggests that European corn borer populations in refuge corn fields are barely detectable in most fields in most years. A scouting program conducted from 1988 through 1991 produced similar results. Also, farmers pay a \$12 to \$15 technology fee to purchase these hybrids. Therefore, it is questionable that planting *Bt*-transgenic corn hybrids can be justified, economically or otherwise, based solely on European corn borer control. Currently refuge management allows refuge farmers to plant *Bt*-transgenic corn hybrids. Service policy regarding this may change in the future. So far only one farmer has planted 120 acres (18% of total corn acres) of this type of hybrid on refuge crop land.

3f Fire Management

The weather cooperated in March and 95 acres of cool-season grasslands were prescribed burned. Seven native grass units, totaling 88 acres, were burned in mid-May. Woody vegetation continues to be a problem, especially in the native grasslands.

A new 1100 gallon metal tank was designed and ordered from J.L. Houston Company for \$1898.00. This will replace the old tank on the military 6x6 truck, which began to rust out.

3g Plant Pest Control

Exotic plant species, which often aggressively invade new habitats, are of particular concern and are receiving more management attention. The Department of Interior has published a list of plant species considered exotic, invasive or a nuisance species.

The following plant species on the Interior's "hit list" have been observed at DeSoto NWR:

- ▶ Clover, yellow sweet (*Melilotus officinalis*) - A biennial routinely planted as a single-year green manure crop in the refuge's biological crop rotation. Also, it was planted as a nurse crop (i.e., a nitrogen source) with newly seeded warm-season grasses until 1994. If it is allowed to produce seed, it can be a significant problem since the seed can remain viable in the soil profile for decades.
- ▶ Reed canary grass (*Phalaris arundinacea*) - Common floral under story component in riparian corridors along the Missouri River.
- ▶ Smooth brome grass (*Bromus inermis*) - Refuge personnel routinely planted it to establish permanent ground cover in the early history of the refuge. It has been planted in more recent history as a living firebreak. Currently 255 acres are being managed as cool-season grass habitat and buffer strips around crop fields.
- ▶ Purple loosestrife (*Lythrum salicaria*) - This pest was first observed in 1998. The infestation was restricted to a remnant river chute on the refuge near the Missouri River. This chute is frequently flooded during moderate to high river water levels. Plants were hand weeded in both 1998 and 1999. Infestations are likely coming from established sites upstream.
- ▶ Common reed (*Phragmites australis*) - This pest has been present for many years. Small scattered infestations are found along agricultural drainage ditches that flow into DeSoto Lake and along the lake shoreline. Population density has steadily decreased due to annual application of glyphosate. Currently there are 23 georeferenced infestation sites totaling only 3 acres.
- ▶ Musk thistle (*Carduus nutans*) - This weed pest is the most common invasive species on the refuge. Ten widely scattered georeferenced infestations affect 67 acres. Some infestations contain high population densities. The musk thistle seed head weevil (*Rhinocyllus conicus*) has been monitored since 1995 and 1000 adult beetles were also released in 1995. The number of seed heads infested with this insect has steadily increased over the years. However, musk thistle population has not yet been noticeably affected.

- ▶ Velvet leaf (*Abutilon theophrasti*) - This is a very common species in crop land habitats and disturbed sites. It is rarely observed in well-established permanent vegetation.

Other plant pest species observed on the refuge, but in isolated sites and very low population levels are: Autumn-olive (*Elaeagnus umbellata*), Canada thistle (*Cirsium arvense*), Cats claw vine (*Macfadyena unguis-cati*), Cotoneaster (*Cotoneaster* sp.), Crown vetch (*Coronilla varia*), Dame's rocket (*Hesperis matronalis*), Tall fescue (*Festuca elatior*), Henbit (*Lamium amplexicaule*), Common mullein (*Verbascum thapsus*), Multiflora rose (*Rosa multiflora*) and Tree of Heaven (*Ailanthus altissima*).

Other species of concern are Chinese elm (*Ulmus parviflora*), Roughleaf dogwood (*Cornus drummondii*), Smooth sumac (*Rhus glabra*) and Eurasian watermilfoil (*Myriophyllum spicatum*). Chinese elm is an exotic while Roughleaf dogwood and Smooth sumac are native species. All three tree species, particularly Roughleaf dogwood, are encroaching on of grasslands throughout the refuge affecting 511 acres. Eurasian watermilfoil has not been observed in DeSoto Lake or its other aquatic environs, but has been reported in an Iowa DNR managed lake within a few miles of DeSoto.

Sixteen miles of the refuge's boundary was mowed to control woody vegetation. This is an annual maintenance practice.

4

Fish and Wildlife Management

4a Bird Banding

Personnel from Iowa Department of Natural Resources spent a day on the refuge with the staff banding Canada geese. Thirty geese were banded and six birds were recaptured.

4b Disease Monitoring

Disease monitoring is done throughout the year. A sick Bald Eagle was found in October and taken to the Raptor Recovery Center in Omaha. The bird was diagnosed with lead poisoning and subsequently died.

A mange outbreak began in the coyote population in the fall. It spread very rapidly. Coyote numbers dropped swiftly throughout the winter.

4d Nest Structures

Wood ducks seem to have abandoned the 61 nest boxes on the refuge. Only two boxes were used by wood ducks, only one hatched six eggs. On the other hand 29 are being used by screech owls. We will maintain these boxes for owls or ducks, but we will experiment with some new boxes closer to the water.



Banding Canada geese - Refuge has worked with Iowa Department of Natural Resources for many years on this project. Photo:BW

5

Coordination Activities

5a Interagency Coordination

The Project Leader, Biology program, Private Lands program, and Public Use program interacted and coordinated activities with many different federal, state, county and local governments and non-governmental organizations throughout the year. High profile examples included pooling grant monies with Ducks Unlimited, USDA Natural Resources Conservation Service (NRCS), and IA Department of Natural Resources to restore wildlife habitat throughout the 18-county Private Lands program service area; coordinate the refuge's law enforcement program with Harrison and Washington Co. Sheriffs Departments; developing the Marquardt Pond Environmental Learning Site for youth fishing clinics with volunteers and a corporate donor; coordinating land acquisition and habitat restoration with USFWS Region 6 Realty, Papio-Missouri Natural Resources District, NRCS Wetland Reserve Program, U.S. Army Corp of Engineers and local landowners; updating NE legislators and the NE Game & Parks Commission on USFWS programs and emerging issues; and working with local farmers to manage the refuge's unique crop land program.

5c Private Lands Activities

Outreach efforts to help private landowners with habitat improvement and wildlife issues continues to expand every year. During the year, landowners, County Conservation Boards, the Natural Resource Conservation Service, the Golden Hills Resource Conservation and Development, and the Loess Hills Alliance were provided site evaluations, technical assistance for habitat restorations and enhancements, and cost share monies. Five of the eighteen counties in the coordination area benefitted from this assistance. Refer to sections 2a Wetland Restoration and 2b Upland Restoration for information regarding specific projects.

A significant amount of time was spent this year working with the Loess Hills Alliance, which is a significant promoter of natural resource conservation within the Loess Hills region. The Alliance is well organized and has received grants totaling one million dollars. Four committees have formed under the alliance umbrella. These are the Protection, Information and Education, Economic and Development, and the Stewardship Committee in which DeSoto's local Private Lands Coordinator represents the USFWS. Some programs that were initiated and continue within the Stewardship committee include: fire ecology workshops (including S-130 & 190 firefighter training), intern programs, fire caches throughout the Loess Hills for landowner/intern use, cedar tree removal, involvement with the Iowa State University Extension Master Conservationist program, and establishing a directory of programs and contacts for landowners who need technical and financial assistance to protect their Loess Hills property.

5d Cooperating Associations

The Midwest Interpretive Association (MIA) has completed its nineteenth year of operation. Bruce Barkley, the association's business manager, a non-government employee. Along with DeSoto, the Association also administers outlets at Mingo, Squaw Creek, Swan Lake, Horicon, and Lewis and Clark Lake, which is a facility of the U.S. Army Corps of Engineers, near Yankton, South Dakota. Total sales decreased 6.98 percent this year compared to last year's receipts. Revenue received from the sale of educational books, artwork, photographs, T-shirts, postcards, and posters at the DeSoto Visitor Center totaled \$73,676.23, and \$28,053.33 in donations. MIA sales activities are itemized in Table 5e.1 (below).

MIA provided a luncheon for the Audubon winter bird count, sponsored a Refuge open house, an Audubon Society "Birds of Prey" program, and provided ribbons for the student art show valued at \$311.92. The business manager also contributes assistance to the refuge's computer operations and interpretive programs. Contributed assistance to all MIA outlets is valued at \$4,620.00.

Table 5e.1 *MIA Sales activity for FY 00*

Outlet	Gross Sales	% of MIA Sales	Monetary Contributions
DeSoto	\$73,676.23	53.27	\$311.92
Mingo	4,897.84	3.54	51.00
Squaw Creek	13,977.71	10.11	2,114.86
Swan Lake	2,927.06	2.14	0
Horicon	17,173.38	12.41	2,106.29
Lewis and Clark Lake	25,633.77	18.53	1,947.18
Total	\$138,285.99	100.0	\$6,531.25

The Association received another \$25,000 anonymous donation. These funds will be used for Phase II of the visitor center's exhibit renovation. This donation, and the \$25,000 anonymous donation from last fiscal year, and other additional contributed funds, will be used to offset the refuge's expense for this renovation.

6

Resource Protection

6a Law Enforcement

Six hundred sixty-three (663) law enforcement incidents occurred during the fiscal year. Four incidents were felonious and 14 were drug violations of which two involved methamphetamine. The following summarizes law enforcement activity:

582 warnings issued
51 citations issued
6 assists to county or state officers
15 miles of boundary maintained

Significant incidents were:

- ▶ In April, a Lewis and Clark brochure was found in the headquarters mailbox with racist and right wing propaganda written on it. This information was forwarded to FWS Special Agent Walt Kocal.
- ▶ In June Officer Taylor responded to a domestic dispute at the visitor center parking lot. After arriving on-scene it was determined that a young couple had gotten into an argument and the female struck the male with the car. Harrison County deputies arrived and after talking to witnesses determined that it had been an accident. No charges were filed with the male visitor refusing medical assistance.
- ▶ In the fall Officers Taylor and Lutz, and other federal and state agents, successfully assisted FWS Special Agent Mark Webb with Operation Fish Tale serving arrest and search warrants in the area. This was the culmination of a two-year undercover operation in the illegal take and sale of deer, fish, turtles, moose, and other animals across state borders. More than 70 people were cited or arrested.

A new patrol vehicle, a Dodge Quadcab pick-up truck, was purchased and fully equipped.

6b Permits and Economic Use Management

Five Special Use Permits (SUP) were issued during the year. These were one each for commercial fishing, bee keeping, beaver removal, and two for the guided snow goose hunting program. These latter two permits were for contracted hunting guides permitted to guide ten clients per day on DeSoto Refuge to harvest snow geese.

6f Cultural Resource Management

135th Commemorative Steamboat Exhibit - The highlight of the year was a special exhibit, *Mud & Treasure: A Commemorative Exhibit on the Steamboat Bertrand*, featured in the Visitor Center from April 1 through May 23. The exhibit was conceived and created by the museum staff and volunteers. The intention was to give visitors a feeling for what it was like to be a part of the *Bertrand* excavation and to work in the artifact processing laboratory. We found and interviewed many people involved in the early years of the Steamboat *Bertrand* project and incorporated stories and recollections from twenty-three individuals in the exhibit. Original artwork, photographs, and a selection of artifacts not normally displayed were used to illustrate the type of work done in the conservation laboratory.

An opening day reception, hosted by the Midwest Interpretive Association, reunited many participants who had not seen each other since the end of the project, some thirty years earlier. The reception was well attended with guests traveling from as far away as New Mexico and Indiana.

April's visitation increased by nearly 1000 visitors (7,107) from the same month last year. The five-year average for visitation showed a 23% increase with a 40% (\$4,311) increase in sales in the Midwest Interpretive Association's gift shop. The exhibit was scheduled to run one month but due to the enthusiastic response it was held over another month. There were many requests to make the exhibit permanent.

The museum staff continues to interview people who worked with the *Bertrand* cargo either during the excavation, in the processing laboratory, or in other capacities. A highlight for the museum staff was reestablishing contact with and interviewing Sam Corbino and his wife Shirley and the late Jesse Pursell's family.

Special Funding - The museum received \$13,900 from the Region 3's Art & Artifact budget. The funding was spent on projects which improved the permanent storage conditions of the *Bertrand* objects. All services and materials were purchased in FY'00 although some work was not done until later. Projects included:

- Purchase of padding to be placed on all open shelving to reduce damage caused by vibration of objects by the air handler units.



The Sorenson "Crew" who recovered the Steamboat Bertrand artifacts. Photo:BW

- ▶ Purchase of a laptop computer for use with the newly upgraded SmartReader data loggers to monitor the museum environmental conditions.
- ▶ Partially fund the Bertrand Commemorative Exhibit.
- ▶ Purchased ArtSorb to help minimize relative humidity fluctuations in the walk-in cooler.
- ▶ Contract services for Object Conservation Surveys by Julie Riley and Debbie Long of the Nebraska Historical Society's Gerald R. Ford Conservation Center to provide object condition surveys for two groups of objects most in need of conservation assessments (objects with a rubber component and objects with a ferrous metal component).
- ▶ Purchase of archival quality storage materials to rehouse the archival records.
- ▶ Design and fabrication of exhibit/storage mounts by Mayda Jensen of Jensen Conservation Services, for the bellows, washboard and washtub, three of the most precarious objects.
- ▶ A small portion of money helped fund the Mud & Treasure special exhibit, and to add photographs and other documentary materials relating to the excavation to the museum's archives.

Research Requests / Access to Collections - Museum staff responded to 69 requests for information on the *Bertrand*, the cargo, and artifact conservation/curation. Requests came from at least 20 different states (contacts via the internet are often of unknown origin). Topics of interest ranged from calico print buttons and fabric, hat pins and women's hats, brick mason's trowels, footwear, lighting devices, anvils, and ironstone china to name but a few.

The museum staff helped nine individuals or couples with on-site collection research. Some topics of interest included calico fabric, buttons, bandana cloth, cast iron cookware, and hardware. Jerome Petsche, supervisory archaeologist for the *Bertrand's* excavation, spent three days working with the museum's research files.

Loans - The museum processed 21 loan requests for objects and/or images from the collection.

Image loans included 416 slides and photographic prints sent to researchers interested in a wide array of *Bertrand*-related topics. Several books, journal and newspaper articles were published using illustrations borrowed from the Bertrand slide library.

Forty-five catalog number lots of faunal material (codfish and mammal bones) were sent for analysis and description to the McClung Museum, University of Tennessee, Knoxville, TN; Prof. Walter E. Klippel, Department of Anthropology, head researcher.

- ▶ The Mystic Seaport Museum, Inc. in Mystic, Connecticut borrowed 48 types of objects for a major new exhibit, "America and the Sea." The Bertrand objects will be used to help interpret the 'Inland Waterways' section. Objects with associations to Connecticut or the ocean were selected such as a teaspoon and a smoothing plane manufactured in Connecticut, a sardine can label from France, a brass "Tally-Ho" button from England, and codfish bones from Maine. Other examples of the *Bertrand's* cargo included in this

loan are men's boots and a hat, children's shoes, a hair comb, a pick axe head, a shovel, trade beads, a thimble, and miscellaneous bottles (jelly, champagne, and pickles). The objects will remain on exhibit through at least 2003.

Conservation - Staff and volunteers continued upgrading permanent storage conditions of the collection with 32,291 objects handled this year. Of that 30,243 are various types of nails, screws, and spikes. Other objects treated include glass lamp bases, buttons, clothing, and wood and metal steamboat parts. Storage upgrades entail removing acidified storage materials or stopping abrasion damage by individually bagging objects.

- ▶ The *Bertrand* boat parts, metal and wood, stored in the Visitor Center crawlspace were moved to a better storage area. In the process they were counted, cataloged, and relabeled. This was a significant amount of work and we now have a much better understanding of what parts of the boat are contained in the collection.
- ▶ Dr. Larrie Stone performed his yearly examination of the foodstuffs and alcoholic beverages (alcoholic beverages which were not surveyed last year). Thirty-eight bottles of foodstuffs needed treatment for contamination or loss of liquid. Overall, these objects are in stable condition.
- ▶ The photographic materials have been reorganized and rehoused in archival materials. Through the *Mud & Treasure Commemorative Project* some individuals lent their photographs and other memorabilia associated with the excavation. The materials were copied and added to the museum's archives.

Backlog Cataloging / Records Maintenance - This year 121 numbers were fully cataloged and an additional 31 which had been partially completed years ago were finished.

The original laboratory processing card project, which started as a small and simple project, has blossomed into a major undertaking with the potential to significantly improve the accuracy and quality of information in the *Bertrand* catalog records. The museum technician and volunteer Faith Meurrens are methodically working through each card set attempting to identify the catalog numbers treated under each accession number and to place photocopies of the cards in the appropriate catalog folders. They have discovered many discrepancies and missing information in the records and are attempting to fill and reconcile the gaps.

Special Tours / Appearances - Several tours were given by museum staff for groups specifically interested in the *Bertrand*. Groups included a local history class from Iowa Western Community College, the Loess Hills Hospitality Association, the Nebraska Newspaper Association, and photographer Karen Hollingsworth.

- The Iowa Archaeological Society's annual fall meeting was held in southwest Iowa using the Steamboat *Bertrand* as the main theme. Nancy Osborne Johnson, a participant in the excavation, spoke to the group and then they toured the exhibit.

The curator was invited to participate in a "visioning" meeting of the Harrison County Conservation Board - Welcome Center Planning Committee. The curator participated in Dana College's "Expanding Your Horizons," a program for junior high girls to encourage career choices in fields using math and science.

Volunteers - Museum operations benefitted greatly from the help of very dedicated volunteers. Volunteers donated the equivalent of 87 days helping with upgrading storage conditions of many objects in the collection, organizing original laboratory processing cards, organizing and doing the annual random sample survey (SCA volunteer), maintaining the library, typing, and helping with other miscellaneous tasks. Of particular significance was the extra help Dan and Faith Meurrens provided to create the Mud & Treasure special exhibit. While that project was being researched, publicized and created they more than doubled their regular volunteer hours.



Volunteer Faith Meurrens reconstructs lamp bases. One of the many curatorial projects volunteers have helped with this year. Photo:ST

The refuge, in partnership with the Student Conservation Association (SCA), received the services of a 12 week SCA volunteer. A grant from the Mazda Corporation underwrote the cost of the program. Volunteer, Carrie Jefferds, from upstate New York, filled the position and started work in mid-September.

Training - The curator and museum technician completed the 24 hour HAZWOPER training course and are now certified first responders for an event involving hazardous materials.

Other - It had been many years since the Visitor Center's fire detection system had been inspected and tested. Since the building has a Simplex system, and they had a GSA contract for such work, a 100% test was completed in January. Of the 127 pieces tested, 51 failed to pass and eventually were replaced through a separate contract.

Environmental control with the newly installed Liebert units in the Cargo Storage Areas was listed in the problem section last year. This year the ongoing problem of excessive fluctuations of temperature and relative humidity in the storage/exhibit areas was solved. Data Power moved the sensors from their original factory placement in the HVAC units to the ductwork just below the floor in the cargo storage chambers.

Last year's Regional Office safety inspection recommended reducing the quantity of hazardous material in the conservation laboratory. Many chemicals were either outdated or no longer used in the Bertrand Conservation Laboratory. The Dana College Biology Laboratory, The Gerald R. Ford Conservation Center, and the Missouri Valley High School darkroom received 29 different chemicals which otherwise would have been disposed of as hazardous waste.

There were intermittent problems with the fire alarm system, some alarms were clearly weather related but other were more mysterious. Eventually, maintenance mechanic Stambaugh discovered the backup battery in the universal power system was dead. He replaced the battery and there have been fewer false alarm events although there still may be some "bugs" in the system.

After several years with no water in the conservation lab, maintenance staff reworked the plumbing to provide building water to one sink.

At long last, the museum offices and library received new carpeting at the beginning of the year. Other parts of the building, including the theme gallery, were also recarpeted necessitating emptying both large exhibit cases and removing wall vitrines. It was sometime before everything was restored back to order.

Compared to last year's whopping catch of 80 mice, this year only 32 mice were trapped in the Visitor Center. The Freeman volunteers worked hard to find and block as many potential entryways as possible, their efforts have paid off.



7

Public Education and Recreation

7a Provide Visitor Services

Visitation - We had a moderate *El Nino* summer and the public, usually, accessed all parking lots, boat ramps and walking trails. Refuge visitation was a little less than the previous fiscal year (236,770 vs. 256,245). The 10-year average is 281,160 visitors per year.

The 1999 fall snow goose migration was late and partially bypassed us affecting visitation. November is normally the busiest month of the year. Last year's visits to the refuge in November totaled 41,976. This fiscal year there were only 20,596 visits in November, a 51% decline. Saturday and Sunday, November 27 and 28 were the peak days with 1,614 and 1,647 people, respectively. The three-day Thanksgiving weekend attracted 4,851 visitors to the refuge, helped by the arrival of 200,000 geese. The decline in snow geese numbers this year and the peak population wasn't reached until early December, halved November visitation. The visitor center store experienced a 28% sales decline

Summer refuge visitation, Memorial Day through Labor Day, totaled 90,873 people. There were 6,027 people on Memorial Day weekend, 5,238 on the July Fourth weekend, and 3,846 on Labor Day Weekend. This was a 3% increase over last summer's visitation.

The visitor center hosted 99,939 people this fiscal year. This was the second full year of visitor center operation after the exhibit remodeling in August 1998. The ten-year average for visitor center use is 126,779 visits.

Table 7a.1 FY 2000 Visitor Activity Comparisons		
Activity	Activity Units ¹	Activity Hours
Interpretation	382,000	149,078
Environmental Education	8,871	25,197
Consumptive Wildlife Recreation	20,328	54,915
Non-Consumptive Recreation	226,080	143,743
Non-Wildlife Recreation	3,441	1,721
Total Activity Hours		374,654

¹Activity Units = Number of visitors X the number of activities a visitor is involved in during a single visit.

Interpretation - DeSoto Visitor Center contains exhibits on cultural history, natural history, wildlife, conservation and FWS-oriented displays. Two galleries feature displays about the Steamboat *Bertrand*, which sank in 1865, and the effects of westward expansion on the habitat and wildlife in the Missouri River Basin. Another gallery contains three new life-size diorama depicting Missouri River wetlands, woodlands, and grasslands as they would have appeared to Lewis and Clark in 1804.



Curator Sarah Tuttle hosts a tour of the Visitor Center and Bertrand Exhibit for the Loess hills Association, a local conservation NGO.
Photo:BW

The refuge continues to enjoy the outcome of rehabilitating some interpretation facilities. Wilderness Graphics, Inc., Tallahassee, Florida, solved many of these interpretive needs in the visitor center, the refuge, and particularly at the new Boyer Chute National Wildlife Refuge. The new information desk, three life-size dioramas, and a sixfold increase in the sales area were popular with visitors and well worth the temporary inconveniences during construction.

The three-minute steamboat excavation video is viewed on a 21-inch monitor in a 'shipping crate' in the Cargo Viewing Gallery. The VCR and monitor generally work well in the 'crate'. Both visitor-activated videos are popular, but tapes and machines need regular maintenance when they are viewed 15-20 times a day throughout the year. Upgrading these to laser-disk or CD is planned.

Our two orientation films "Seeds of Change" and "Off the Beaten Path" are usually shown hourly during the week, and on the half hour on weekends and during heavy-use periods. We also regularly show "America's National Wildlife System: Where Wildlife Comes First." A total of 21,439 people viewed these introductory films, in addition to all school groups. Our special weekend wildlife films were viewed by 2,687 people.

DeSoto Visitor Center hosted a variety of temporary special exhibits:

- ▶ The annual Student Wildlife Art Show was held during March. This year was the 16th annual showing. One hundred forty-five works from 32 classes in 16 Iowa and Nebraska schools (K-12) were exhibited. Award ribbons were provided, and all participants received a personalized parchment certificate. Judges were Milt Heinrich (Blair, NE), Tom Walker (Harlan, IA), and Russell Christensen (Neola, IA). More than 8,000 visitors enjoyed the exhibit in the center's multipurpose room.
- ▶ An exhibit about the excavation of the Steamboat Bertrand "Mud and Treasure" was hosted in April. This was put together by the museum staff and told the story of artifact

conservation and the excavation. This marked the 32nd anniversary since the excavation in 1968 and 69. The exhibit and publicity attracted many people back to the refuge who previously worked on the collection, and increased by 28% the number of visitors who came in April.

<i>Table 7a.2 FY 2000 Visitor Center Exhibits and Activities</i>	
October 1-31, 1999	DeSoto Refuge Computer Art (Kent Peters)
January 15-February 25, 2000	Iowa's Wild Places
January 6-19	Federal Junior Duck Stamp Exhibit
February 7-28	Stan Buman Photography Exhibit
March 1-28	Student Wildlife Art Exhibit
April 1-30	Steamboat Bertrand Anniversary Exhibit
April 16-22	National Wildlife Week
April 22	Earth Day Program "Making Room for Bluebirds"
May 13	IMBD Bird Walk with Jerry Toll
June 5-Aug 30	Lewis and Clark: Up the Missouri river
June and July	Outdoor Writers Association Exhibit
July 1-31	Wildlife Woodcarving Exhibit (Dick Carman)
August 26	Omaha Raptor Team (Jenny Henrickson)
September 9-17	Prairie Appreciation Week

- ▶ A Lewis and Clark exhibit was featured from June 5 to August 30. Their expedition passed through the area in 1804, and likely camped on the refuge near Wood Duck Pond, after leaving the "council bluff" August 3. The refuge is officially listed as an attraction on the NPS's Lewis and Clark National Historical Trail.
- ▶ Prairie Appreciation Week featured an exhibit of native grasses the week of September 11-19. This program teaches the students the historical importance of prairies. More than a hundred students participated in the onsite environmental education program and field walk. Most of the educational presentations are by the DeSoto NWR volunteers.
- ▶ Framed computerized photography of DeSoto Refuge by Kent Peters of Blair, NE, was exhibited from October 1-31.

Other Interpretive Programs - The refuge continues to attract an impressive variety of foreign visitors. They came from India, Iran, Ecuador and 52 other nations. Our registration book also records people from all 50 states, and Puerto Rico.

Staff presented talks and programs to a variety of groups other than students. A total of 123 organized groups and bus tours, containing 3,698 persons, visited the refuge. Programs on endangered species, wetlands, grassland management, wildlife management, low-input sustainable crop production and the steamboat *Bertrand* were all subjects for programs given to specialized groups by staff and volunteers.

Public Information - The staff responded to 9,745 public inquiries. This includes 9,345 telephone responses and 419 written responses. Twenty-one news releases were sent to news media in Iowa and Nebraska, and major Kansas, Missouri, and South Dakota media resources. Our mailing list consists of 225 television, radio, and newspapers; this covers most of the media markets in our two-state area. Special information was provided to the Omaha World Herald, Blair Enterprise, Missouri Valley Times News, Des Moines Register, Council Bluffs Nonpareil, and Lincoln Journal-Star newspapers. Ten interviews were granted to newspapers and seven to TV/radio representatives. Topics included goose migration, art show, fishing, auto-tour, the Bertrand Collection, and our special exhibits.

Students - The refuge is active with students and classes especially in spring and fall. A total of 8,781 students (488 classes) visited and were involved in environmental education programs. Teachers supervised many of their own classes at the refuge, and borrowed films, slides shows, and videos to use back in their classrooms.

Our busiest months were May and November with 2064 students (120 classes) and 2,603 (138 classes) respectively. In the fall, most students come to learn about "Birds in Migration" and "Prairie Appreciation Week." Overall, most of our classes work on the "Artifacts and Lifestyles" cultural resources packet provided by the refuge during their spring visit. As part of a full two-day environmental education program on the refuge, fifth-grade classes from Blair's Arbor School received instruction in canoeing and cooking breakfast over an outdoor grill.



Volunteer Harry Duncan continues to be active leading youth environmental education programs.
Photo:BW

Thirteen college classes used the refuge this year. Creighton University, Clarkson College, Drake University, Dordt College, Westmar College, the University of Nebraska, Iowa State University, Iowa Western Community College, the University of South Dakota, Morningside College, Hastings College, University of Connecticut and Northwestern College.

Entrance Fees - This was the 13th year of entrance fee collection. Convenient self-registration stations are near both entrances to the refuge, and another is in the visitor center. The daily fee is \$3 per vehicle. Our annual refuge pass sells for \$10. Commercial vehicles pay \$20 daily, or \$30 if more than 20 people are aboard.

Table 7a.3 Fiscal Year Entrance Fee Data				
Year	Refuge Cost	Receipts	Permits Issued	Refuge Visits
1988	\$19,483	\$60,534	30,267	382,003
1989	\$23,039	\$61,750	30,876	386,030
1990	\$20,145	\$56,087	28,044	390,929
1991	\$23,590	\$48,684	24,342	371,139
1992	\$26,167	\$54,317	27,159	313,584
1993	\$46,070	\$64,137	18,689	297,475
1994	\$35,751	\$76,398	20,888	302,727
1995	\$35,000	\$85,832	25,730	309,288
1996	\$35,000	\$90,367	24,275	270,998
1997	\$35,000	\$72,126	18,490	237,531
1998	\$35,000	\$70,990	18,006	255,064
1999	\$35,000	\$79,895	19,310	256,245
2000	\$35,000	\$62,313	16,682	236,770

Entrance fees collected were down 22 percent this year to \$62,313 from \$79,895 in 1999. We sold 16% fewer permits overall. Because of the fee demonstration program, the refuge keeps all but the Duck Stamp sales, which dived from 981 to 326 as our cheaper Refuge Pass (\$10) became better known. Also, because the Golden Eagle Passes increased in price from \$50 to \$65, a future sales decline for this pass is likely too. It costs an estimated \$35,000 to administer our entry fee program.

Table 7a.4 FY2000 Entrance Fee Permits		
TYPE OF PERMIT	NUMBER	RECEIPTS
Single Visit (\$3)	14,842	\$44,528
Groups/Commercial (\$20 & \$30)	61	\$1,520
Golden Eagle Passports (\$50)	38	\$2,275
Golden Age Passports (\$10)	337	\$3,370
Golden Access Passports (NC)	59	NA
Federal Duck Stamp (\$15)	326	\$4,890
Refuge Pass (\$10)	573	\$5,730
Total	16,236	\$62,313

Interpretive Foot Trails - The four foot trails were used by more than 35,000 visitors. Volunteers performed "trail patrol," picking up litter and pruning overhanging branches, and periodically restocking the Wood Duck Pond and Cottonwood Nature Trail dispensers with interpretive leaflets. Guided tours of the trails were provided to 1,259 visitors (approx. 60 groups). Volunteers provided most of these tours, mostly for conservation-oriented tour groups that called ahead for reservations. Because of high water the previous summer, the bridges at Wood Duck Pond Trail floated away, effectively curtailing this trail's use all year.

Interpretive Tour Routes - The Auto Tour runs from October 15 through November 30. This includes the peak of the snow goose spectacle. The current route ends at the new "Bob Starr Wildlife Overlook" and people return on the same seven miles of paved road. Generally, this route continues to be well accepted by the public. Although it does exclude them from the unpaved gravel part of the road that continues the loop around Center Island. Compared to previous routes, there are fewer law enforcement problems, less seasonal signing is required, and traffic disturbance at the eagle roost site is eliminated since automobiles no longer pass nearby. Cottonwood picnic ground was kept open during the auto tour, as was the Bertrand Excavation Site and Missouri River Overlook. These sites help to disperse traffic during peak-visit periods. More than 33,500 people drove the horseshoe-shaped tour route during the 47-day period. As usual, the best overall snow goose viewing was from the visitor center viewing gallery. Bob Starr Wildlife Overlook was next best.

Fishing - Recreational fishing on DeSoto Lake was active from the start, with the mild winter and spring conditions, water temperatures were ideal for the April 15 opening. Thus, excellent crappie and large mouth bass fishing enticed anglers to grab their rod and reel and head for the "Bend." Black and white crappie sizes were reported up to 14" in length. Majority were 8-10"

and often caught off rock jetties or from boats. Large mouth bass, though fewer and more illusive than panfish, were located by those that knew where, when, and how to fish for them. This was the first year in five years that spring runoff and flooding of our lake facilities didn't hinder access and fishing availability.

Flathead catfish was the species of choice for several anglers this summer. Their patience paid off, as at least four flatheads ranging in size from 22 to 50 pounds were harvested during the six-month fishing season.

There were four fishing tournaments during the fishing season. Seventy-three large mouth bass were caught for a total weight of 230 pounds at three bass tournaments. Average weight per fish was 3.15 pounds. Last year, there were two tournaments with 62 bass caught for a total weight of 163 pounds. The average weight that year was 2.62 pounds per bass. The fourth tournament was the Pottawattamie Bowhunters, which harvested 154 carp weighting 390 pounds by 72 anglers, in early June.

The dedication and ribbon cutting ceremony for the new Marquardt Pond Environmental Learning Site took place on the 26th of August. This two-year project included the renovation of a small secluded pond located off the East Dike Road of the Refuge. This was accompanied by the construction of a disabled fishing pier, picnic shelter, pit toilet, and rock parking lot. This pond is now one and a half surface acres and is dedicated to environmental education for youth.

Adult leaders can arrange thru Special Use Permits to bring their youth groups to the site to teach outdoor ethics, angling skills, and other environmental education programs. A management plan has been written and approved, setting guidelines and standards to maintain a quality learning environment. Thanks go out to former FWS Special Agent Cleveland Vaughn and the New Era State Laymen's Association, former Manager George Gage, the Omaha Indian Tribe, American Family Insurance, and the staff of DeSoto for their support and efforts.



Three fishing clinics were held at DeSoto during the summer. Approximately 90 youth and 35 adults participated in these annual events. Both the New Era State Laymen's Association and the Omaha Tribe brought youth, of all ages and backgrounds, for a day of learning, fishing, and fun.

Commercial fishing to remove rough-fish continued again this year, with the first nets placed on

March 30 and the final ones pulled September 1. Only one commercial fishing permit was issued this year therefore, the totals for the year were the lowest since commercial fishing on DeSoto Lake started. Total rough-fish harvested during the five months of netting was 1,985 lbs. including 1,754 lbs. of buffalofish and 131 lbs. of carp. Totals in 1999 were 9,109 lbs. and 6,856 lbs. in 1998.



Stocking efforts continued again this year, with 5,000/ 6" channel catfish and 900/ 7.5" walleye released for recreational fishing and to maintain the predator/prey balance in DeSoto Lake.

The ever increasing population of gizzard shad in DeSoto Lake was witnessed first hand the week of May 2-8th. A local angler observed large gizzard shad spawning along the shoreline in large numbers every evening for a week.

White-tailed Deer Hunting - A total of 675 Nebraska and Iowa archery deer hunters spent 1,902 hours harvesting 25 white-tailed deer. These numbers are gathered from a voluntary sign-in sheet.

This was our second year to conduct two three-day muzzle-loader deer hunts. The first hunt was October 23-25, the second from December 11-13th. The first hunt 88 hunters logged 1,363 hours during 154 visits to harvest 53 deer. The success rate was 60 percent. The second hunt 101 hunters logged 1,981 hours during 202 visits to harvest 35 deer. This was a 34 percent success rate. Previously the success rate has been about 50%.

Waterfowl Hunt - The refuge staff expended substantial effort to change the traditional Controlled Waterfowl Hunt to a snow-goose-only hunt in response to the continental snow goose overpopulation problem. This was the first year of the new "guided" hunt in which two commercial guides were contracted to conduct the hunt. However, the snow goose migration was late. Geese did not arrive here until November 22. The first day of hunting occurred November 23. The guides were only able to hunt 16 days before the refuge season ended on December 16. A total of 122 hunters (including guides) put in 2,905 hours afield to harvest 60 snow geese of which 24 were immature. Peak population was only 200,000. It is assumed that after feeding west of their normal staging grounds they migrated west of DeSoto bypassing the refuge. What was hoped would be a typical migration to evaluate the hunting format turned out to be one of the oddest migrations in DeSoto's history. However, the guided hunt will be continued next year.

Mushroom Hunting - 6,386 people visited the refuge in search of the highly sought after morel mushrooms.

7b Outreach

Staff responded to speaker requests by civic groups for DeSoto programs whenever asked. Bruce Weber spoke to a Blair group about Monarch butterflies August 8, and to 1,000 people at Fontenelle Forest Association's Wings and Wildlife Day. He gave a program to Blair Optimists June 16 and spoke at Blair High School's Career Night September 9.

Steve Van Riper spoke to the Layman's Auxiliary Banquet (100) about DeSoto's environmental learning site May 26, the Master Conservationist program (25) Sept 19, and at Harrison County's Ducks Unlimited Banquet (175) Sept. 14. Curator Sarah Tuttle spoke at the Iowa Archeology Society's meeting and tour. George Gage spoke at the Wildlife Society's meeting at Halsey, Nebraska Oct. 22, about Missouri River habitat restoration. Bill Lutz spoke to the Dana College Advancement Group (15) June 19. Marco Buske spoke to the Master Conservationist program (25) Sept 26 on the refuge's low-input sustainable farming practices.

Many group meetings are hosted here. The visitor center is the site for semimonthly meetings of the Loess Hills Alliance.

The refuge also does outreach by lending videos. Eleven video loans reached a combined audience of 440.

8

Planning and Administration

8a Comprehensive Conservation Planning

DeSoto initiated its Comprehensive Conservation Plan (CCP) process during the summer of 1998. Throughout the next fiscal year (FY99) we identified the elements of the document. With feedback from the public and various focus groups, the goals, objectives and strategies the CCP started to take shape.

The CCP team of Jim Salyer, Judy McClendon and Leon Kolankiewicz convened team meetings in November 1999, and January 2000. These meetings were held with Region 3 U.S. Fish and Wildlife Service officials and biologists in Fort Snelling, Minnesota, to critique and revise the draft alternatives, associated goals and objectives. Much of the discussion then focused on the plan's format and the size of the refuge's farming program.

In February 2000, the planning team met for two days with the DeSoto staff to further refine the goals, objectives and strategies. By summer the first draft of the CCP was produced. From July through September the plan underwent review and revision by the planning team, refuge staff, regional office, national office and other FWS duty stations. The public was provided a 30-day period to comment on the plan in September. On September 7th, an open house was held at the refuge for the public to discuss the plan with refuge staff. By the end of the fiscal year finishing touches were being applied. Soon it would be sent to the Regional Office for final review and approval.

8b General Administration

Bill Lutz, 27 year National Park Service veteran, came on board October 15th. He is the refuge's first "Chief Ranger" and supervises all visitor services, cultural resources and law enforcement. George Gage, Project Leader, retired in March after 22 years devoted to DeSoto and 34 years with the Service. George occupies his time in retirement by hunting, fishing, hunting, reading, hunting, attending motorcycle races and hunting.

Larry L. Klimek, new Refuge Manager, began his tour of duty at DeSoto National Wildlife Refuge on July 20. He filled the Refuge Manager position which had been vacant for six months. He came to DeSoto from Cape Romain National Wildlife Refuge, Charleston, South Carolina.

Brent Taylor, Law Enforcement Officer at DeSoto National Wildlife Refuge, was detailed to Squaw Creek National Wildlife Refuge with Boyer Chute NWR Officer Mike Ellis for three days in December 1999 to assist with law enforcement duties for "Bald Eagle Days."

Volunteers - DeSoto continues to use volunteers of all ages. We had 87 individuals this year whose tasks ranged from environmental education, wildlife surveys, trail maintenance, visitor center support, to library and museum conservation. Recruiting and scheduling such a variety of people is a challenge.

- ▶ Volunteers contributed 4,108 hours for which the refuge expended \$3,300. Activity categories included:

Table 8b.1 <i>Volunteer Activities and Hours</i>	
Monitoring and Studies	339
Habitat Management	180
Cultural Resource Management	653
Public Education and Recreation	1,828
TOTAL HOURS	4,108

- ▶ The Annual Volunteer Recognition Luncheon was held February 17 at noon. Twenty-four volunteers and nine staff members attended. Chief Ranger Bill Lutz gave a program about the "Surprising Early History of the Great Plains." In addition to awards, volunteers were given National Wildlife Refuge calendars and volunteer logo key chains.

chosen "Volunteer of the Year" for the Society's decade of volunteer assistance to DeSoto NWR. It provides speakers for visitor center programs and help with the annual snow goose population censuses and the spring and Christmas Bird Counts.



Bruce Weber (far right) presents "Volunteer of the Year" to the Omaha Chapter of Audubon Society represented by Jerry Toll, Ione Werthman and Lisa Peterson (l to r) Photo:BL

- ▶ Volunteer Gary Caldwell was awarded a 1000 hour pin for maintaining nature trails. Gary commutes 30 miles each way and comes to the refuge two or three days a week. His work is never ending, keeping the trails clean and removing debris falling from the aging cottonwoods that line the paths.
- ▶ The Rod Freeman Family (mother, father, and three sons) were awarded a 1000 hour pin for their museum conservation work.


- ▶ Volunteer interns Brooke Hallberg of Iowa Lakes Community College and Michelle Shriver of Dana College contributed 480 and 124 hours, respectively, working on public use activities in the visitor center.
- ▶ Foreign student intern Junior McDonald (Iowa Western Community College) of Jamaica contributed 368 hours working and learning crop scouting techniques, soil sampling, invasive species management and GIS/GPS.
- ▶ Museum operations benefitted from the help of volunteers who helped in nearly all aspects of the museum. Volunteers helped by organizing and upgrading storage of archival photographs and museum objects, organizing original laboratory processing cards, handling environmental monitoring programs including remote data loggers and IPM, recording location changes, maintaining the library, rotating textiles and helping with many other miscellaneous tasks.

8c General Maintenance

Major maintenance activities started and/or completed this fiscal year were as follows:

- ▶ Removed three dilapidated toilets and replaced with three free standing concrete pit toilets.
- ▶ Installed one free standing concrete pit toilet and built a 40' disabled accessible fishing pier at Marquardt Pond for the new Environmental Learning Site.
- ▶ Due to flooding in 1999 the fishing pier at Bullhead Pond, and the boat ramp and dock at the Bertrand parking lot were removed and replaced.
- ▶ At Wood Duck Nature Trail, the floating boardwalk was repositioned and reinforced, and the trail was resurfaced up to the boardwalk. Several years of flooding had severely damaged a large section of this trail, which is now opened after three years.
- ▶ Installed a new bridge consisting of two flatbed rail car bodies in a service road to the Refuge's firing range. The bridge was donated by a neighboring landowner. It will improve surface drainage from the neighbor's crop land. A small culvert was replaced for this much larger structure.
- ▶ Moved the range's backstop/bunker to prevent lead from leaching into the ground water and eventually into DeSoto Lake.



- ▶ Staff completed laying 1 and 1/4 miles of rip-rap on the north shore of DeSoto Lake.
 - ▶ Staff completed laying gravel on a 'Center Island' service road which was started in 1999.
 - ▶ Staff laid crushed limestone to 6 1/2 miles of refuge service roads.
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- ▶ A new well head and plumbing were installed at the Visitor Center. This was contracted with Jensen Well Company, Blair, NE.
 - ▶ Five new park benches were installed and trail overlooks refurbished on several nature trails.
 - ▶ The Visitor Center's boilers were rehabilitated by Johnson Boiler Company, Omaha, NE.
 - ▶ The kitchen sinks, faucets, and garbage disposals were replaced or newly installed in all three Refuge residences.

8d Safety

Monthly safety meetings and Quarterly Safety Committee meetings were held throughout the year. The intent of these meetings is to update and train personnel, and resolve any safety concerns that arise during the year. Safety meetings are assigned to individual staff members who are then responsible for providing programs. Topics this year included gambling, cancer, security awareness training, stress, OSHA violations, fraud, chain saw safety, Hantavirus disease, vehicle survival kits, first aid kits, and fire extinguishers.

Quarterly safety meetings/inspections were conducted during the year, with concerns presented to the Refuge Manager. All concerns were addressed with the majority being corrected. Some are still to be corrected due to funding or further investigation.

The station's Environmental Compliance Audit is discussed in Section 8e.

During the year, all fire extinguishers were checked, proper first aid kits and universal precaution kits were made available to staff, required physicals for fire and law enforcement personnel were provided, water samples were taken and analyzed, and lyme disease and Hepatitis B vaccines were made available to staff determined to have the greatest likelihood of exposure to these viruses.

Red Cross First Aid and American Heart Association CPR refresher training was provided to the staff in February. Also accomplished during the year was to use the new SMIS computer software system for all accident reporting.

8e Compliance

Regulatory findings were submitted in September in compliance with the Environmental Compliance Audit which was conducted by Regional Office Safety Officers in August 1999. Deficiencies were identified and corrective actions have been completed on several deficiencies. Hazardous materials removal, drinking water requirements, general house keeping and proper storage of equipment and flammable items are some of the frequently identified deficiencies needing attention. Many deficiencies require the entire staff to do their part to prevent unsafe conditions for staff and visitors.

